

232.05. METHOD OF MEASUREMENT.

Seeding will be measured by the acre (hectare).

NOTE: Work and material used in repair of seeding will not be measured for payment.

Watering will be measured by the kiloliters of water. The method of measurement is in accordance with section 230.05. Water used as a carrier for seed in hydraulic seeding operations is considered subsidiary to "seeding" and will not be measured for payment.

Fertilizer will be measured and paid for in accordance with Section 234.

Mowing will be measured and paid for in accordance with Section 241.

232.06. BASIS OF PAYMENT.

Accepted seeding, measured as provided above, will be paid for at the contract unit price bid for as follows:

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|-----|------------------------|-------------------|
| (A) | SEEDING METHOD A | ACRE (HECTARE) |
| (B) | SEEDING METHOD B | ACRE (HECTARE) |
| (C) | SEEDING METHOD C | ACRE (HECTARE) |
| (D) | WATERING | M-GAL (KILOLITER) |

Such payment shall be full compensation for furnishing all materials, equipment, labor, and incidentals to complete the work as specified.

SECTION 233 MULCHING

233.01. DESCRIPTION.

This work shall consist of furnishing, applying, and fastening mulching materials on the soil surface in accordance with these Specifications and in reasonably close conformity with the areas and locations shown on the Plans or established by the Engineer.

233.02. MATERIALS.

Materials shall meet the requirements specified in the following Subsections of Section 700 Materials. These materials can be used either as a temporary protective item or as a protective mulch for seeded, sodded, or planted areas.

Vegetative Mulch	735.05(a)
Asphalt Mulch	735.05(b)
Excelsior Mat	735.05(c)
Jute Mesh	735.05(d)
Excelsior Mulch	735.05(e)
Wood Cellulose Fiber	735.05(f)
Nylon Erosion Control Mat	735.05(g)
Mulch Fasteners	735.06

233.03. EQUIPMENT.

The Contractor shall furnish equipment in accordance with Subsection 108.06.

(a) **Equipment for Vegetative & Excelsior Mulch.**

- (1) **Adhesive Spray Method.** The machine for applying and fastening Vegetative and Excelsior Mulch shall have a blower mechanism for distributing the vegetative material, and a pump for distributing the liquid adhesive. The discharge pipe of the blower and the discharge nozzles of the liquid adhesive hoses shall be arranged so that the liquid adhesive is evenly distributed into the mulch as it emerges from the blower discharge spout. The liquid adhesive hoses shall have suitable valves and nozzles to provide distribution of the liquid-adhesive at the prescribed rate. Sufficient power shall be provided on the machine to operate the liquid adhesive pump and the mulch blower and distribute the liquid adhesive-bound mulch over the designated areas at the required rate with a single pass of the machine. The beater mechanism shall be adjusted so that the stem lengths are not materially shortened.
- (2) **Mulching Tiller Method.** The machine for applying vegetative or excelsior mulch shall be the same as specified for the "Adhesive Spray Method," except that the liquid adhesive pump and accessories may be omitted. The mulching tiller shall be a heavy disk-type roller, having flat disks about 6 millimeters thick and spaced not more than 12 inches (300 mm) apart.

(b) **Equipment for Wood Cellulose Fiber Mulch.**

- (1) The hydraulic equipment used to apply wood cellulose fiber mulch shall be factory designed and built with sufficient pump capacity to apply specified quantities. The slurry tank shall hold a minimum of 1000 gallons (3.8 kiloliters) and be equipped with a mechanical agitation system with operating capacity sufficient to suspend and homogeneously mix the mulch and water. The slurry distribution hoses shall be large enough to prevent clogging and be equipped with spray nozzles that will provide even distribution of the slurry on designated areas.
- (2) The equipment shall be mounted on a traveling unit which may be either self-propelled or pulled, and is capable of getting the tank and nozzles within sufficient proximity of the area without tracking into the mulching area.

- (c) **Equipment for Asphalt Mulch.** The distributor equipment shall be equipped with a pressure gauge and accurate volume-measuring device or a calibrated tank. Also, the distributor shall be equipped with a power unit for the pump, and a full circulation, adjustable, spray bar and hand-operated spray bar.

NOTE: A check of distribution rate and uniformity of application shall be made when directed by the Engineer.

- (d) **Equipment for Jute Mesh.** A lightweight, smooth roller (lawn type) shall be used to press the mesh into direct contact with the soil.

233.04. CONSTRUCTION METHODS.

(a) **Mulching Operation.**

- (1) When the mulch material is used as a temporary protective item, repair eroded areas and clear the ground of all debris that would hinder the even application of the mulching material.

- (2) When the mulch material is used as a protective mulch over seeding or sodding, apply it within 24 hours after an area is seeded or sodded. If mulched areas become damaged, reshape the area and then sod or seed and mulch again as originally specified.

NOTE: Mulching operations shall not be performed during weather that would result in non-uniform application or waste of material.

(b) **Type of Application.**

- (1) **Adhesive Spray Method for Excelsior and Vegetative Mulch.** Broadcast the vegetative or excelsior mulch into a continuous, unbroken cover of approximate uniform thickness. Apply the mulch at the rate of 2 tons per acre (4.5 metric tons per hectare). During the spreading operation, the adhesive material must be ejected simultaneously into the mulch at the mulch blower discharge spout, giving a uniform distribution on the mulching material. Unless otherwise specified on the Plans, use emulsified asphalt, SS-1, at the rate of 2000 gallons per acre (1870 liters per hectare). If other types of fasteners are to be used, the type and quantity will be shown on the Plans. To avoid displacement of mulch by wind, place a bank of soil or a complete coverage of asphalt along the edge of the mulched area. Remove clumps of excess material promptly.
- (2) **Mulching Tiller Method for Excelsior and Vegetative Mulch.** Spread the mulching materials uniformly as specified in the Adhesive-Spray Method. The rates of application shall be 2.5 tons per acre (5.6 metric tons per hectare) of vegetative mulch or 2 ton per acre (4.48 metric tons per hectare) of excelsior mulch. Following closely behind the mulch spreading operation, roll a tiller over the mulched area, pressing the material into the soil approximately 3 inch (75 mm). Till dry, impermeable soil with a disk plow to the degree necessary to permit the 3 inch (75 mm) incorporation. When mulching loose sandy soil, take precautions not to incorporate an excess amount of the mulch into the soil. When mulching slopes, operate the tiller along the contour of the slope.
- (3) **Asphalt Mulching.** Dilute the mulching asphalt with 3 parts water to one part emulsified asphalt. Apply 1.25 gallon per square yard (5.66 liters per square meter) of the mixture of ground surface, unless otherwise specified. If soils to be mulched are impervious and cause appreciable mixture runoff, reduce the water so that the specified quantity 0.3125 gallon per yard (1.415 liters per square meter) of emulsified asphalt can be applied. When asphalt mulch is to be applied over sodded areas, water the sod immediately before applying the asphalt mulch.
- (4) **Wood Cellulose Fiber Mulch.** Apply wood cellulose fiber mulch at the rate of not less than 1200 pounds per acre (1345 kg per hectare) of air dry material. The quantity of water used in dispersing, suspending and applying the material shall be at the rate 3.3 gallons of water to one pound (27.5 liters of water to one kilogram) of material. Apply the cellulose fiber to form an evenly distributed layer over the area.

NOTE: Complete seed, fertilizer, lime, and other erosion control items before applying cellulose material.

- (5) **Excelsior Mat.** Place the mat as shown on the Plans so that the fibers are in contact with the soil and the netting is on the top. Place each strip of mat parallel to the direction of the flow of water.
- (6) **Jute Mesh.** When jute mesh is used over sodded or sprigged areas, place it prior to watering operations. Unless the hydro-seeding method is called for on the Plans, place the jute mesh after the seed or sod has been planted, and secure it as shown on the Plans. Maintain the jute mesh-covered areas until all work on the project is completed and accepted. Reshape damaged slopes to their original slope lines, then fertilize, seed, or sod, and cover with jute mesh again as originally specified.

233.05. METHOD OF MEASUREMENT.

The mulching items will be measured as follows:

Vegetative mulching, excelsior mulching, and wood cellulose fiber will be measured by the acre (hectare).

Asphalt mulching will be measured by the gallon (liter) of undiluted emulsified asphalt.

Excelsior mat and jute mesh will be measured by the square yard (square meter) of area covered.

233.06. BASIS OF PAYMENT.

Accepted mulches, measured as provided above will be paid for at the contract unit price as follows:

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|-----|----------------------------|----------------------------|
| (A) | VEGETATIVE MULCHING | ACRE (HECTARE) |
| (B) | EXCELSIOR MULCHING | ACRE (HECTARE) |
| (C) | ASPHALT MULCHING | GALLON (LITER) |
| (D) | WOOD CELLULOSE FIBER | ACRE (HECTARE) |
| (E) | EXCELSIOR MAT | SQUARE YARD (SQUARE METER) |
| (F) | JUTE MESH | SQUARE YARD (SQUARE METER) |

Such payment shall be full compensation for furnishing all materials, equipment, labor, and incidentals to complete the work as specified.

SECTION 234 FERTILIZING AND AGRICULTURAL LIMING

234.01. DESCRIPTION.

This work shall consist of furnishing and applying fertilizer or agricultural liming materials in accordance with these Specifications and in reasonably close conformity with the areas and locations shown on the Plans or established by the Engineer.

234.02. MATERIALS.

Materials shall meet the requirements specified in the following Subsections of Section 700 Materials.

Fertilizer	735.07
Agricultural Limestone	706.04
Hydrated Lime	706.01